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ABSTRACT

A study examined a format for fear appeal messages that introduced a threat through one medium (i.e., a segment of dramatic television programming) and the recommended action through another medium (i.e., the verbal presentation of safety guidelines by an adult to a child). Subjects, 138 elementary school children from a middle-class elementary school in Madison, Wisconsin, were exposed to a videotape of a dramatized sequence depicting either fatal accidents or neutral events involving either fire or water. Their affective responses were assessed during exposure and immediately after viewing the videotape. They rated the likelihood that such an event would occur, the perceived severity of such events, and the degree to which they worried about such events. Next, they were taught safety guidelines appropriate to the subject matter of the event they had just watched. Finally, they gave ratings of how safe or dangerous it would be not to follow both fire and water safety guidelines and how important they thought it was to comply with them. Results indicated that children who watched dramatized accidents considered the relevant safety guidelines more important than children who watched neutral events on the same topic or neutral or threatening events involving unrelated activities. Perceived dangerousness of not complying was significantly affected by both the topic of the drama seen and whether or not subjects had seen a dramatized accident, but the interaction was not significant. In regression analyses, emotional arousal and the three cognitive responses predicted perceived importance of the guidelines differently for the different topics. There were no significant interactions between the cognitive responses. (Seven tables of data are included. Contains 26 references.) (RS)

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EFFECTS OF DRAMATIZED DEPICTIONS OF ACCIDENTS ON GRADE SCHOOL CHILDREN'S RECEPTION OF SAFETY GUIDELINES[1]

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ABSTRACT

Grade-school children were exposed to a videotape of a dramatized sequence depicting either fatal accidents or neutral events (movie version) involving either fire or water (movie topic). Their affective responses were assessed during exposure and immediately after viewing the videotape. Following this, they rated the likelihood that such an event would occur, the perceived severity of such events, and the degree to which they worried about such events. Next they were taught safety guidelines appropriate to the subject matter of the event they had just watched (i.e., either fire safety or water safety). Finally, they gave ratings of how safe or dangerous it would be not to follow both fire and water safety guidelines and how important they thought it was to comply with them.

Consistent with general findings in fear appeals research, it was expected that children viewing threatening events would regard safety guidelines related to that event as more important and failure to comply with them as more dangerous than children who had seen neutral events. Predictions from fear appeals theories were evaluated regarding the contributions of emotional responses and perceptions of the threat's severity and likelihood and the effectiveness of the recommended actions.

Over all, the results indicated that children who watched dramatized accidents considered the relevant safety guidelines more important than children who watched neutral events on the same topic or neutral or threatening events involving unrelated activities. Perceived dangerousness of not complying was

significantly affected by both the topic of the drama seen and whether or not subjects had seen a dramatized accident, but the interaction was not significant. In regression analyses, emotional arousal and the three cognitive responses predicted perceived importance of the guidelines differently for the different topics. There were no significant interactions between the cognitive responses. The results are discussed in terms of the ways in which adults can use televised drama to promote safety and in terms of their implications for fear appeal theories.

EFFECTS OF DRAMATIZED DEPICTIONS OF ACCIDENTS
ON GRADE School CHILDREN'S RECEPTION OF SAFETY GUIDELINES

In a world in which drugs, AIDS, and accidents are facts of life, parents and educators are forced to make difficult decisions about how to ensure the safety of grade school children. Out of concern, many schools implement curricula addressing these topics, and many parents directly discuss them with their children.

Although children do encounter threatening events in real life, children are exposed to many more incidents of diseases, accidents, and disasters through television. Newscasts, documentaries, movies, and fictional stories targeted at children, such as "Little House on the Prairie," "Alf," and "The Wonder Years," present a wide array of real-life threats in dramatic form.

Exposure to dramatizations of realistic threats has the potential to produce negative effects on children. Cantor and Omdahl (1991) found that children who witnessed dramatic depictions of threatening events said they worried about the threat more, viewed the threat as more likely and more severe, and expressed less interest in activities related to the threat than those who had been exposed to a neutral television clip.

Several developmental experts have also pointed out the general dangers of exposing young children to frightening mass media stimuli that are beyond their capacity to comprehend and assimilate (e.g., Ollendick, 1979; Singer, 1975). Many parents can attest to nightmares and concerns expressed by children

witnessing frightening television.

Although these concerns are very important, our purpose in this paper is to look for the "silver lining" in the cloud of exposure to televised depictions of threatening events. We will examine whether exposure to dramatized threatening events offers "prime" opportunities to teach safety guidelines to children. Given the serious threats to which grade-school children are exposed, parents and educators need information about the conditions that maximize motivation to learn and apply safety guidelines.

Traditionally, fear-appeals research has focused on messages that present a threat and threat-avoidance techniques within a single medium (see Leventhal, 1970; Beck and Frankel, 1981 for reviews). For example, films used in drivers' education courses present both hideous accidents and guidelines that could prevent those kinds of accidents.

In this study, we examine a different format for fear appeal messages. We test the effects of introducing the threat through one medium (i.e., a segment of dramatic television programming) and the recommended actions through another medium (i.e., the verbal presentation of safety guidelines by an adult to a child in face-to-face interaction). We examine whether grade-school children will regard safety guidelines to be more important after they have been exposed to a dramatic media depiction involving an accident than after exposure to neutral television programming. Our initial prediction is:

H_1: Children who see dramatized depictions of accidents will perceive safety guidelines aimed at preventing such accidents to be more important than children who see dramatizations involving similar activities with benign consequences or dissimilar activities, independent of the consequences.

If this hypothesis is confirmed, the study will have important applications. Parents and educators working with grade school children may want to make use of dramatized depictions of realistic threatening events. Parents could discuss safety guidelines when such opportunities arise in regular family television viewing. Educators and caretakers may want to expose children to carefully selected media depictions as a prelude to teaching safety procedures.

On a theoretical level, this study is also designed to explore theoretical predictions about fear-appeal messages. In order to present the theoretical issues of importance, the next section presents a brief review of fear appeal theories.

A Review of Fear Appeal Theories

Most theories and models offered to account for the relationship between fear appeals and measures of persuasibility can be grouped under either Drive Theory or the Parallel Response Model. In this study, we propose hypotheses arising from both lines of theorizing.

Behavioristic drive theory was the first major explanation offered for the effectiveness of fear appeals (Janis & Feshbach,

1953). The drive paradigm originated in animal learning studies (Dollard & Miller, 1950; Miller, 1951) and was applied to fear appeals in the following manner. Danger information was believed to induce an emotional fear reaction which produced an unpleasant drive state. The person was then motivated to reduce this state by performing or mentally rehearsing the action recommended to avert the danger (Janis & Feshbach, 1953). This sequence predicts that the greater the emotional response, the greater will be the compliance with the recommended action.

Counter to this prediction, Janis and Feshbach (1953) failed to obtain a positive linear relationship between fear and persuasion. They found that people rejected the recommended actions in high fear conditions. Janis and Feshbach (1953) identified three possible reasons for a rejection of appeals due to high fear: 1) interference with learning; 2) aggression directed at the fear appeal source; and 3) defensive avoidance due to the emotional tension.

Search for cognitive mediators for drive explanations. Researchers examined all three of the explanations offered by Janis and Feshbach's 1953 article (e.g., Dabbs & Leventhal, 1966; Duke, 1954; Janis & Milholland, 1954; Janis & Terwilliger, 1962; Leventhal & Niles, 1964; Leventhal, Singer, & Jones, 1965; McGuire, 1968, cited in Janis, 1967). Based on the outcomes of these studies, Janis (1967) offered a positive curvilinear model for the relationship between fear and persuasibility.

Janis (1967) stated that the emotional state is based on the

perception of external threat: The greater the perceived threat, the greater the fear. The fear level was expected to be positively associated with: 1) vigilance directed toward threat-relevant signs; 2) the seeking of reassurance to reduce tension; and 3) the willingness to adopt new attitudes. Janis also predicted, however, that each person has a threshold for the degree of external threat and corresponding fear beyond which these responses do not occur. If the external threat surpasses this threshold, the person becomes overwhelmed and loses cognitive efficiency. Consequently, in high fear states, people are unable to maintain the vigilance and efforts to gain reassurance which lead to the adoption of the recommended actions and attitudes.

The parallel response model. Despite all of the efforts to devise a curvilinear model that would account for the varying results of fear appeal studies, critics ultimately judged the drive explanations to be inadequate (Higbee, 1969; Leventhal, 1970). One of the major problems was the assumption that fear arousal was a critical link in acceptance of the message.

Rescorla and Solomon (1967) provide two compelling reasons why the emotion of fear might not be an effective mediator of the adoption of recommendations. First, protection from aversive events frequently requires sustained processes, like cognitive representations, rather than reflexive responsivity to visceral events. Second, the traditional association of fear with peripheral, visceral activity readily lends itself to an emphasis

upon reduction of the emotional state rather than avoidance of the danger.

Parallel response model. Based on the arguments opposing fear as a mediator, Leventhal (1970) proposed a parallel response model. In this model, emotional arousal is not essential for the person to be motivated to avert the danger. Rather, the recognition of external threat acts as a stimulus resulting independently in both problem solving behavior and emotional responses. Neither response causes the other. When the person's actions are focused on the problem solving process, the person is engaged in the cognitive level of "danger control." When the person's actions are guided by emotional behavior, the person is engaging in "fear control." People consciously attend to one level or the other and can switch back and forth between the two levels.

The parallel response model seemingly accounts for the data obtained in fear appeal studies. Situations in which the subjects reported low fear arousal yet adopted the recommended attitudes and behaviors are explained by the focus on controlling the danger rather than the person's awareness of his/her internal state. Studies in which subjects reported high fear arousal and adopted the recommendations in the message are explained by the person's awareness of both levels of control. Negative relationships between fear arousal and adoption of the messages' recommendations are explained by a predominant or complete focusing on fear control.

It quickly becomes apparent, however, that there are no data for which this model cannot account. Thus, at the stage of the parallel processing model discussed here, it is unfalsifiable. This has been a major attack on the parallel processing model (Beck & Lund, 1981; Boster & Mongeau, 1984; Rogers, 1975; Witte, 1992).

Several theorists have viewed the parallel response model as revolutionary in its separation of fear processing and danger processing (Rogers & Deckner, 1975; Beck & Frankel, 1981). Consequently, these theorists have moved toward specifications within the danger control level proposed by Leventhal (1970) that afford falsifiability.

In 1975, Rogers proposed Protection Motivation Theory. Following in the footsteps of expectancy-value theorists such as Atkinson (1958), Lewin (1938), and Rotter (1954), Rogers (1975) based human action on the expectancy that the actions will be followed by some known consequence of value.

Rogers (1975) identified three important components of fear appeals: 1) the magnitude of noxiousness of a depicted event; 2) the probability that the event will happen provided that nothing is done to avert its occurrence; and 3) the availability and effectiveness of a coping response that might eliminate or reduce the likelihood of the deleterious event. These three elements, respectively, lead to three cognitive mediating processes: 1) appraisal of the severity of the threat; 2) expectancy or likelihood that the event will happen; and 3)

belief that the recommended action is useful in averting the danger. These three processes were believed to promote intentions to adopt recommended action or belief independently and in interaction with each other.

Several studies have examined the predictions made by Rogers (1975). Using path analysis, Rogers and Mewborn (1976) found that severity and efficacy led to intentions to adopt the message, but likelihood did not (Rogers & Mewborn, 1976). They did not find the anticipated triple interaction among perceived severity, expectancy, and efficacy. The path analysis indicated that the emotional state of the person (fear arousal) did not directly lead to intentions to adopt the message; rather, the effect of the aroused fear on compliance was mediated by the cognitive appraisal of threat's severity. This was interpreted by Rogers and Mewborn (1975) as evidence supporting Leventhal's (1970) assertion that a person's emotional state is not the key determinant in attitude, intention or behavior change in response to a fear appeal. Similar results were found by Mewborn and Rogers (1979).

Typically, the studies conducted by Rogers and his colleagues have manipulated information in the fear appeal messages addressing noxiousness, likelihood, and efficacy. "Neutral" or "control" messages are expected to communicate low levels of noxiousness, likelihood, and efficacy without action, while intense messages are designed to create high levels. The corresponding measurements of these variables (i.e., perceived

severity, likelihood, and efficacy) are expected to be affected by the message condition.

Following the original predictions set forth by Rogers (1975), we hypothesize that:

H_2: Perceived severity, likelihood, and efficacy will predict significant portions of the variance in the perceived importance of following the recommended actions. Specifically, higher levels of each variables will be associated with greater perceived importance of the safety guidelines.

Consistent with Rogers (1975), and based on assumptions of expectancy-value theory (Feather, 1959), we further predict that:

H_3: Perceived severity, likelihood, and efficacy will interact in determining the perceived importance of following the recommended action.

Consistent with the assertions of Higbee (1969), Leventhal (1970), and Rogers (1975), it might be expected that fear would not directly affect the perceived importance of safety guidelines. This leads us to hypothesize that:

H_{4a}: Fear and/or emotional arousal will not explain a significant proportion of the variance in commitment to safety guidelines.

However, a recent paper by Dillard (1993) argues that the fear component of fear appeals has not been given an adequate test, and suggests that fear and its attendant emotional arousal should contribute to acceptance of "threat communications."

Therefore, we advance an alternative hypothesis as follows:

H_{4b}: Fear and/or emotional arousal will explain a significant proportion of the variance in commitment to safety guidelines.

Finally, Leventhal (1970) suggested that fear may interact with processing on the danger control level. Witte (1992) has extended this argument and claims that fear will interact with efficacy. Witte claims that at high levels of efficacy, fear will function to motivate the person to adopt the safety behaviors. However, at low levels of efficacy, fear will debilitate the person's ability to process the safety recommendations and will negatively affect acceptance of the recommended actions. In an effort to check Leventhal's general assertion and Witte's specific prediction, we ask:

RQ: Will fear interact with any combination of perceived severity, likelihood, or efficacy to explain a significant proportion of the variance in commitment to safety guidelines?

Method

This study is an extension of the research reported by Cantor and Omdahl (1991). It involves the same subjects and some of the same procedures and data that were used in the earlier research, but incorporates further procedures and additional measures in order to address fear appeal predictions. More detailed descriptions of some of the procedures may be found in the earlier publication.

Subjects

Subjects were 138 children from a middle-class elementary school in Madison, Wisconsin. All participants received parental permission before participating. Approximately equal numbers of children were recruited from kindergarten through fifth grade, and the 67 males and 71 females were approximately evenly distributed throughout the grades.

Procedure

Subjects were tested individually in a room at their school. The experimenter told the subject that he or she would watch some television stories about nature in Wisconsin, see a story about some children, and be asked to answer some questions. Then a small sensor, used to measure skin temperature, was attached to the subject's finger, and the researcher made sure the subject was comfortably seated to watch the videotape.

Individual subjects were shown the nature stories followed by one of six stimulus programs, which were analyzed to reflect four stimulus groupings.[2] After viewing the stimulus program, the subjects were asked several questions about their emotional reactions, their worries, and their perceptions of the likelihood and severity of related events. Following these questions, subjects were taught safety guidelines relevant to the topic of the movie clip they had seen. After the safety training, subjects answered questions addressing the importance of both fire and water safety guidelines and the dangerousness of not complying with them. Upon completion of the study, subjects were

thanked and escorted back to their classrooms.

Materials

A neutral tape was used to adapt the children to the experimental setting. The neutral tape was composed of three segments, lasting approximately one minute each, showing Wisconsin woodlands, a farmers' market, and nature scenes.

The stimulus audiovisual tapes were obtained from three different sources. All of them were four-and-a-half-minute segments from films and programs that grade school children were likely to watch. The threatening fire scenes were from an episode of "Little House on the Prairie" in which the school house and dormitory burn down. In the clip, two grade-school age boys sneak to the basement of the school to smoke a pipe. When one of the school workers enters the basement, the boys hide the pipe by dropping it into a basket. Later the pipe begins smoldering and starts the house on fire. During the fire, adults are shown helping the school children escape the flames. When one of school workers goes to retrieve the teacher's baby, she hears a boy calling for help. Once the worker escorts the boy to safety, she returns for the baby. She and the baby are shown helplessly engulfed in flames. The scene ends with a long shot of the rescued children outside the burning house.

The neutral fire scene was taken from a G-rated children's adventure film entitled My Side of the Mountain. The edited clip shows a boy and a man who are spending time in the woods. They sing by a campfire, make clay pots by a river, walk in the

prairie, play a tune on their recorders, and cook breakfast over an open fire.

The water accident scene was taken from Jaws 2. The shark was completely edited out of the selected scene, and the clip showed two adolescents, a boy and a girl, sailing. While the boy is standing up in the boat, a big wave hits the side and the boy falls into the water. The boat drifts far away from the boy, and the girl, left stranded in the boat, does not know how to sail. The boy starts to swim toward the boat. However, when he gets near the side of the boat he suddenly becomes exhausted and begins to go under. As the girl stares in shock, the boy goes under for the final time. None of the Jaws theme song appeared in the clips.

The neutral water clip was also taken from Jaws 2. The edited segment presents children sailing and children and adults engaged in a variety of beach activities (e.g., sun bathing, eating, playing in the water, building sand-castles, etc.).

Safety Guidelines

Subjects who viewed the dramatizations of water-related events were taught three water-safety guidelines, and those who had seen dramatizations involving fire were instructed on three fire-safety guidelines. The safety guidelines were presented orally and visually. The visual aids portrayed Pound Puppies (popular media characters) engaged in safety-related situations. For water safety, the guidelines were: 1) never stand up in a small boat; 2) wear a life jacket when riding in a boat; and 3)

only swim where there is a lifeguard or adult to supervise you. The guidelines for fire safety were: 1) talk with your parents about a safe way to get out of your house in a fire; 2) make sure there are smoke detectors that work in your house; and 3) cook or use matches only when there is an adult present to supervise you.

Each of these guidelines were explained in few sentences. For example, the admonition addressing smoke detectors was worded as follows:

> "The second thing you can do is make sure that your home has a smoke detector. A smoke detector can warn us about fire even when we are sleeping or in another room. Ask your parents if you have a smoke detector. Have them show you where it is. And, make sure it has batteries that are working."

Measures

Manipulation checks. The previous article associated with this data set (Cantor & Omdahl, 1991) reports data indicating that the subjects understood the extent of danger and injury that existed in the threatening versions of the videotapes.

Subjects' fear. Subjects' affective responses that are relevant here were assessed using self-reports of degree of fear and skin temperature as an index of physiological arousal.

Self-reports of fear were assessed immediately after the videotape ended. Subjects were asked, "How did you feel when you were watching the last program on television?" After responding

to the open-ended question, subjects were asked if they felt "happy," "sad," "scared," or "just ok." These response options were presented with visual aids that depicted faces representing each of the emotions. The order of the response options was rotated. Subjects who responded with "happy," "sad," or "scared" were asked, "How happy/sad/scared did you feel?" The subjects were presented with four response options: 1) a little bit, 2) pretty, 3) very, and 4) very, very. In order to help the subjects remember the response options, the four intensity ratings were also presented using visual aids. The type size for the phrases became larger with increasing intensity: The letters constituting "a little bit" were approximately .5 cm high and those making up "very, very much" were 1 cm high. Above the words were pictures of androgynous faces expressing intensities of the emotion that corresponded to the intensity of the option. The subjects could either state their response or point to it. For the analyses to be reported here, any response other than "scared" was scored as zero.

Skin temperature was measured using a Cyborg Biolab computer. Based on measurements taken through a small sensor that was attached to subjects' pinky finger, the computer calculated the average temperature for each two second interval. Skin temperature measurements were taken during the last neutral videotape segment as a base rate, and again during three 20-second intervals at the beginning, middle, and end of the experimental segments. The difference between base level and the

final 20-second interval of the experimental video was the measure used in the analyses reported here.

Threat-related perceptions. Three threat-related perceptions were assessed 1) likelihood of threatening events, 2) severity of threatening events, and 3) worry about threatening events. Visual aids were used for all three measures and the order of the fire and water items was rotated from subject to subject.

Likelihood of event occurrence was assessed by asking the subjects how likely they thought different events were. After an explanation of the likelihood scale, subjects were told that the researcher wanted to know how likely they thought certain things were to happen. Included in the list of things to be rated were the perceived likelihood of getting into a dangerous situation in the water and not being able to swim to a safe place, and the perceived likelihood of being in a fire. The five response options were 1) not at all likely, 2) a little bit likely, 3) pretty likely, 4) very likely, and 5) very, very likely.

Perceived severity of events was measured by asking subjects how "bad" they perceived certain events to be. Among the events rated were "being in water and feeling like you couldn't swim to safety" and "being in a fire." The response options were: 1) not at all bad, 2) a little bit bad, 3) pretty bad, 4) very bad, and 5) very, very bad.

Worry about threatening events was examined by asking subjects how much they worried about five different things that

varied in their degree of relatedness to the depicted threats. Among the items rated were being in a fire and getting hurt in the water. The five response options were 1) not at all, 2) a little bit, 3) pretty much, 4) very much, and 5) very, very much.

Safety guideline measures. A measure of perceived dangerousness of not following guidelines was taken following presentation of the safety guidelines. Children were asked whether it would be safe or dangerous to disobey each of the guidelines (e.g., "Is it safe or dangerous to live in a home that doesn't have a smoke detector?") If the child responded that it would be dangerous to disobey the guideline, the researcher followed-up with a question addressing the extent of the danger (e.g., "How dangerous would it be to live in a home that doesn't have a smoke detector? Is it a little bit dangerous, pretty dangerous, very dangerous, or very very dangerous?" At the same time as the researcher named the answer options, the child was shown a response board depicting circles of increasing sizes, with the corresponding answer options printed beneath them. If the child indicated that disobeying the guideline was safe, the word safe was substituted for dangerous in the follow-up question. This same two-question sequence was used to assess the perceived dangerousness of not complying with each of the guidelines. Each resulted in an eight-point scale ranging from "very very safe" to "very very dangerous." Scaled responses to the three questions were added, and their sum ranged from 3 to 24 for each threat.

These responses were conceived of in two ways. First, they were thought of as an indicator of the degree to which the information in the safety guidelines was acquired and accepted. Second, they were thought of as an inverse measure of "efficacy." In other words, for example, the more strongly a subject believed that standing up in a boat was dangerous, the more he or she was thought to consider the admonition not to stand up in a boat as an effective means of preventing boating accidents.

The major measure of acceptance of the safety admonitions was perceived importance of following the guidelines. Children were asked how important it was to follow each of the recommended guidelines (e.g., "How important is it to cook or use fire only when an adult is watching you?"). The response options were "not at all important, a little bit important, pretty important, very important, or very, very important" This produced a five-point rating scale. Once again, a visual aid with increasing circle sizes was used to represent the increasing magnitude of the responses. The responses on the three items for each threat were summed to yield an index ranging from 3 to 15.

Results

Effect of Media Exposure on Reception of Safety Guidelines

Importance of following guidelines. To determine the effects of exposure to the dramatic films and the safety guidelines on perceived importance of following the guidelines, analyses of covariance for rated importance of the guidelines were done separately, once for the fire guidelines and then for

the water guidelines. These data were analyzed in an analysis of covariance (with age in months as the covariate), using a 2 x 2 design (fire vs. water topic and threatening vs. neutral version of movie), based on which video the subject saw before being exposed to the guidelines.

It should be kept in mind that although all subjects rated the importance of both water and fire guidelines, they received only one set of guidelines--those that were relevant to the movie they had seen. Thus, subjects who saw movies involving fire received the fire safety guidelines, but those who saw movies involving water did not.

The analysis of covariance for importance of fire safety guidelines yielded significant main effects of topic ($F(1,128)=7.95$, $p<.001$) and version ($F(1,128)=34.25$, $p<.001$). The interaction approached significance ($F(1,128)=3.34$, $p<.07$). The means associated with this analysis are presented in Table 1. As can be seen from the table, comparisons by the Scheffe procedure showed that the mean rated importance in the threatening fire version was significantly higher than in the other three conditions, and these conditions did not differ significantly from each other.

Insert Table 1 about here

The analysis of covariance for importance of water safety guidelines yielded a significant main effect of topic ($F(1,128)=10.62$, $p<.001$), but the effects of version

($F(1,128)=2.79$, $p=.097$) and the interaction ($F(1,128)=3.72$, $p=.056$) both approached significance. The means and subsequent tests are displayed in Table 2. As can be seen from the table, subjects who saw the threatening drama involving water thought the water safety guidelines were more important than those who saw either of the movies involving fire. There were no other significant differences among the means.

Insert Table 2 about here

Because the patterns of means for the two analyses were highly similar, with the highest degree of importance always occurring in the condition in which the threat in the movie was related to the guidelines presented, we did a third analysis combining these two items in a repeated-measures design. In this analysis, a within-subjects factor was added, involving the relevance of the guidelines to the topic of the movie the subject had seen. For subjects who had seen movies involving fire, fire safety guidelines were considered relevant and water guidelines were irrelevant; for subjects who had seen the movies involving water, water safety guidelines were relevant and fire guidelines were irrelevant.

Insert Table 3 about here

This analysis yielded only a trivial effect for topic, but a significant effect for threatening vs. nonthreatening version of the movie ($F(1,129)=16.65$, $p<.001$). As expected, there was also

a significant effect of relevance ($F(1,129)=40.62$, $p<.001$) and, most importantly, a significant relevance X movie version interaction ($F(1,129)=10.44$, $p<.01$). Table 3 displays the means associated with this interaction. As can be seen from the table, subjects exposed to the threatening version of a topic that was relevant to the guidelines they received thought that these guidelines were significantly more important than subjects in any of the other conditions. There was also a significant relevance X topic X version interaction ($F(1,129)=7.85$, $p<.01$). This interaction derived from the fact that the difference between the threatening and neutral version of the relevant drama was larger for the topic of fire than for the topic of water.

Dangerousness of ignoring guidelines. The analysis of covariance on the measure of dangerousness of ignoring the fire guidelines yielded significant main effects of movie topic ($F(1,125)=21.51$, $p<.001$) and movie version ($F(1,125)=13.08$, $p<.001$). Subjects who saw movies involving fire (and who received the fire guidelines) thought it was more dangerous to ignore the fire guidelines than those who saw movies involving water (Ms=21.9 and 20.1, respectively). Subjects who saw accidents thought it was more dangerous to ignore the fire guidelines than those who saw neutral events (Ms=21.7 and 20.3, respectively). The interaction was trivial.

The equivalent results were found for perceived dangerousness of water guidelines. The analysis of covariance yielded significant main effects for both topic ($F(1,127)=22.20$,

$p<.001$) and version of the movie ($F(1,127)=8.31$, $p=.005$). Subjects who saw a movie involving water (and who received the water safety guidelines) thought it was more dangerous to ignore the water guidelines than subjects who saw a movie involving fire (Ms=21.8 and 19.7, respectively). Subjects who saw movies involving accidents reported that it was more dangerous to ignore water safety guidelines than subjects who saw neutral events (Ms=21.4 and 20.1, respectively). Again, the interaction was nonsignificant.

Predictors of Perceived Importance of Guidelines

Predictions directly addressing fear appeal theories were tested using multiple regression. Separate analyses were conducted for the fire and water topics. In the regression analysis, variables were entered in blocks. The cognitive variables (i.e., severity, likelihood, efficacy) were treated as one block. The emotional variables (i.e., self-reported fear and skin temperature) were treated as a second block. Finally, all possible interactions entered in a third block.

It is frequently the case that the order in which variables are entered into a regression equation affects whether or not each block of variables explains a significant proportion of the variance in the dependent measure. Since it will be of interest to observe whether cognitive variables or emotional variables explain more of the variance in perceived importance of the recommended guidelines, order becomes important. Order effects occur because the variables entered first actually "get credit"

for variance that is shared with the variables entered later. For this reason, two separated regression analyses were conducted for each topic. On the first analysis, the fear variables were entered first, the cognitive variables were entered second, and the interactions were entered third. In the second analysis, the cognitive and fear variables were entered in the reversed order. The beta weights and associated significance tests were used to determine the contributions of specific variables. The significance levels for beta weights and variance explained by the blocks of variables was set at alpha less than or equal to .05.

Variance Explained by Cognitive and Emotional Variables

The following results were obtained for the separate regression analyses conducted for water conditions and fire conditions. As Table 4 reflects, for the first order of entry

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Insert Table 4 About Here

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for water conditions, cognitive variables accounted for 44% of the variance ($p < 001$), emotional variables accounted for an additional .7% of the variance ($p=.71$), and the interactions accounted for an additional 19% of the variance ($p=.09$).

When the order of entry was altered for the water conditions, the emotional variables account for a greater share of variance explained. Emotional variables entered first accounted for 7% of the variance ($p = .11$), cognitive variables

entered second explained 37% of the variance ($p < .001$), and interactions accounted for 19% ($p=.09$).

Overall, for the water condition, the cognitive variables accounted for a much larger and significant proportion of the variance. The emotional variables and interactions failed to account for major differences in perceived importance of safety guidelines.

For the fire conditions, both cognitive and emotional variables explained sizable proportions of the variance. These results are summarized in Table 5. When the cognitive variables

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Insert Table 5 About Here

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were entered first, they accounted for 62% of the variance ($p < .001$). The emotional variables, entered second, explained an additional 3.5% of the variance ($p = .07$). The interactions, however, did not explain a significant increase in the variance explained when they were entered on the third step (8%, $p = .41$).

When the emotional variables were entered first for the fire conditions, they accounted for 12.6% of the variance ($p = .02$). The cognitive variables, entered second, explained 51% of the variance ($p < .001$), and the interactions accounted for 8% ($p = .41$).

In the fire conditions, the cognitive variables were more powerful than the emotional variables. However, the emotional variables also explained a significant proportion of the variance

when entered first and they approach significance when entered second.

Main Effects for Cognitive and Emotional Variables

The beta weights and associated significance levels for the main effects appear on Tables 6 (water conditions) and 7 (fire conditions). The beta weights appearing in the tables are those that resulted when all of the main effects were entered into the regression equation.

Based on the findings of Rogers, we predicted that severity, likelihood, and efficacy would have direct effects on perceived importance. As Table 6 reveals, in the water conditions, a significant proportion of the variance in importance was explained by efficacy. Neither severity nor likelihood were significantly weighted. Support for the cognitive main effects was much stronger in the fire conditions. As Table 7 reveals, both likelihood and efficacy were significantly weighted, and severity approached significance ($p = .10$).

Competing hypotheses were set forth for the fear variables. Theories and arguments exist claiming that fear will and will not explain significant proportions of the variance in compliance. In the water conditions (see Table 6), neither self-reported fear nor change in skin temperature explained a significant proportion of the variance in the perceived importance of safety guidelines. However, as Table 7 reveals, change in skin temperature was a significant predictor of perceived importance in the fire conditions. Self-reported fear was not significant in fire

conditions.

Interaction Effect among Likelihood, Severity, and Efficacy

Rogers (1975) original prediction was that there would be a significant interaction among likelihood, severity, and efficacy. In addition, Witte (1992) recently proposed an interaction between efficacy and fear. All possible interactions among likelihood, severity, efficacy, self-reported fear, and change in skin temperature were examined. Consistent with the finding that the block of interactions as a group did not explain a significant proportion of the variance in perceived importance, none of the individual interactions reached significance.

Discussion

The Effects of Dramatized Depictions on Receptivity

Overall, the findings indicate that children identify safety guidelines as being more important when they are presented after dramatized depictions of related accidents than when they are presented after neutral programming. Although the analyses of covariance of perceived importance of fire safety and water safety guidelines differed somewhat, the significant interaction produced in the combined analysis indicates that the combination of the threatening nature of a media depiction and the relevance of that depiction to the safety guidelines produces an effect that is greater than the sum of the separate effects: Subjects exposed to a threatening depiction that was relevant to the safety guidelines they received thought the guidelines were more important than subjects in the other three conditions.

It should be kept in mind that in the present design, relevance was confounded with the provision of guidelines. Thus, the effect of relevance itself may be due entirely to the reception of guidelines, or to that combined with the relevance of the movie content to the guideline questions. In this design, subjects in the "irrelevant" conditions served as true controls in that they responded to the guidelines without having received instructions about them. It is significant to note that in none of the analyses reported did the subjects in the nonthreatening, relevant condition differ significantly from subjects in the nonrelevant conditions, who did not receive the guidelines at all. Thus, it can be argued that only when the guidelines were preceded by a dramatic depiction of the related negative consequences, did they have a measurable impact.

Implications for Fear Appeal Theory

Examination of the specific hypotheses addressing fear appeal theories revealed that cognitive variables explained greater proportions of the variance in perceived importance than did fear variables. Averaging across the ordering of the blocks entered into regression analysis and conditions (fire and water), cognitive variables accounted for approximately 49% of the variance and the fear variables explained approximately 6% of the variance. Thus, the cognitive variables proposed by Rogers (1975) were more powerful in this study than the fear variables highlighted by drive theories.

However, given that fear did explain a significant

proportion of the variance in the fire conditions, there is a needed for closer examination of fear in future research. Recently, both Witte (1992) and Dillard (1993) have recommended that fear be carefully explored in both theorizing and research. The results from this study indicate that it plays a role, albeit a minor one, in getting recipients to recognize the importance of recommended safety guidelines.

In the fire condition, change in skin temperature was significant while reported fear was not. This indicates, as others have suggested (Boster & Mongeau, 1984; Dillard, 1993) that careful measurement of fear may require multiple indicators, preferably including physiological measurement. This is particularly true, if people reaching high levels of fear deny or perceive lower levels of fear than are actually being experienced.

Overall, Rogers (1975) theory received mixed support. Within the fire conditions, the individual cognitive variables proposed by Rogers were generally supported: Efficacy and likelihood were significant, and severity approached significance. In the water conditions, only efficacy was significantly weighted. The failure to obtain a significant three way interaction among likelihood, severity, and efficacy raises doubts about Roger's initial Protection Motivation Theory. Consistent with some of Roger's own research, this study produced stronger support for main effects than the interaction initially proposed.

Methodological Concerns

Before moving on to discuss the pedagogical implications of the research, we would like to highlight some of our methodological concerns. In attempting to draw conclusions about the implication of these results for Roger's Protection Motivation Theory, the nature of the efficacy measure used must be kept in mind. The efficacy measure, which was assessed immediately after reception of the guidelines, asked subjects to indicate how safe or dangerous it was not to follow the guidelines. It was followed immediately by the measurement of the main dependent variable, the importance of following the safety guidelines. It is likely that an important component of the predictive power of efficacy in the regression analyses comes from its conceptual similarity and its proximity in assessment to the dependent variable.[3]

A second concern focuses on the measure of the effectiveness of the fear appeal. We asked children to indicate how important it was to follow the recommended actions. In any study in which actions are recommended, the ultimate measure of effectiveness is whether the safety guidelines are followed. The correlations between self-reported attitudes and actual compliant behavior have ranged from very low to very high (Ajzen and Fishbein, 1982). Future fear appeal research that provides behavioral as well as attitudinal agreement measures is needed.

A final methodological concern is that most of the variables were measured with single items. Single item measures preclude

reliability testing. Unfortunately, research on grade-school children is typically limited by the amount of time each child can be absent from the classroom and the children's short attention spans. Nevertheless, multiple item measures are recommended in future research. With these concerns in mind we turn to pedagogical and theoretical issues.

Pedagogical Applications

The implications of these findings for parents, teachers, and curriculum planners are rather obvious. Dramatized media depictions of threats do make a difference in how children perceive safety guidelines. Adults seeking effective times and methods for teaching safety guidelines may want to capitalize on dramatized depictions of real-life threats that occur in naturally viewed television programming. Adults may also want to intentionally present dramatizations of realistic threats when they are teaching safety guidelines. This study demonstrates that effective fear appeals need not be long, well developed integrations of threatening depictions and safety guidelines presented in a single format (e.g., a 20 minute film presenting both the threat and the guidelines); rather, this study reveals that a four-and-a-half-minute video clip portraying a threat, combined with an adult's explanations of "things to do" can be effective.

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Footnotes

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[2]As in the earlier publication, the original design of the study involved the manipulation of soundtracks as a secondary independent variable. However, because soundtrack variations had a negligible effect, soundtrack versions have been combined.

[3]Given our concerns about the similarity between efficacy and importance, additional regression analyses were conducted deleting efficacy. The two remaining cognitive variables (i.e., severity and likelihood) continued to explain more variance in perceived importance of the safety guidelines than did the emotional variables. In the fire condition, the cognitive variables explained 18% ($p < .001$) of the variance when entered on the first step and 17.8 % ($p < .001$) when entered on a second step (following the entrance of the emotional variables). For the water conditions, the cognitive variables accounted for 15.7% ($p = .01$) when entered on step one, and 12% ($p = .02$) when entered on step two. When efficacy was removed, the emotional variables (i.e., reported fear and change in skin temperature) were significant for fire (step one entry, 12.6%, $p = .02$; step two entry, 12.3%, $p = .01$), but not for water conditions (step one entry 6.9%, $p=.11$; step two entry, 3.2%, $p = .31$).

Table 1

Mean Ratings of Importance of Fire Guidelines

Movie Topic	Movie Version	
	Threatening	Nonthreatening
Fire	13.6_b	11.5_a
Water	11.0_a	10.1_a

Note. Scores could range from 3 to 15. Means with different subscripts are significantly different at $p<.05$ by the Scheffe procedure.

Table 2

Mean Ratings of Importance of Water Guidelines

Movie Topic	Movie Version	
	Threatening	Nonthreatening
Fire	10.8_a	10.9_a
Water	13.0_b	11.5_{ab}

Note. Scores could range from 3 to 15. Means with no letter in their subscripts in common are significantly different at $p<.05$ by the Scheffe procedure.

Table 3

Importance of Safety Guidelines as a Function of Relevance of the Guidelines to Movie Topic and the Threatening Nature of the Story

Relationship of Movie Topic to Safety Guidelines	Movie Version	
	Threatening	Nonthreatening
Relevant	13.3_b	11.2_a
Irrelevant	11.1_a	10.5_a

Note. Scores could range from 3 to 15. Means with different subscripts are significantly different at $p<.05$ by the Scheffe procedure.

Table 4

Regression Analysis Results for the Water Conditions

Order 1

Block #1 (Cognitive Variables - Likelihood, Severity, Efficacy)

R2 = .439, F = 15.71, $p < .001$

Block #2 (Emotional Variables - Fear, Change in Skin Temp)

R2 change = .007, F = .34, p = .71

Block #3 (All Interactions)

R2 change = .193, F = 1.69, p = .09

Order 2

Block #1 (Emotional Variables - Fear, Change in Skin Temp)

R2 = .070, F = 2.28, p = .11

Block #2 (Cognitive Variables - Likelihood, Severity, Efficacy)

R2 change = .377, F = 13.17, $p < .001$

Block #3 (All Interactions)

R2 change = .193, F = 1.69, p = .09

Table 5

Regression Analysis Results for the Fire Conditions

Order 1

Block #1 (Cognitive Variables - Likelihood, Severity, Efficacy)

R2 = .619, F = 31.47, p < .001

Block #2 (Emotional Variables - Fear, Change in Skin Temp)

R2 change = .035, F = 2.84, p = .07

Block #3 (All Interactions)

R2 change = .084, F = 1.07, p = .41

Order 2

Block #1 (Emotional Variables - Fear, Change in Skin Temp)

R2 = .355, F = 4.25, p = .02

Block #2 (Cognitive Variables - Likelihood, Severity, Efficacy)

R2 change = .528, F = 28.55, p < .001

Block #3 (All Interactions)

R2 change = .084, F = 1.07, p = .41

Table 6

Beta Weights for Main Effects Entered into the Regression Equation for Water Conditions

	beta weight	significance
Cognitive Variables		
Likelihood	.01	.92
Severity	.14	.19
Efficacy	.58	.00**
Emotional Variables		
Skin Temperature	-.01	.90
Self-Reported Fear	.08	.44

Note: Skin temperature decreases when people are frightened. Thus, the negative beta weight for change in skin temperature is in the expected direction.

Table 7

Beta Weights for Main Effects Entered into the Regression Equation for Fire Conditions

	beta weight	significance
Cognitive Variables		
Likelihood	.23	.01**
Severity	.13	.10
Efficacy	.68	.00**
Emotional Variables		
Skin Temperature	-.18	.03*
Self-Reported Fear	.05	.56

Note: Skin temperature decreases when people are frightened. Thus, the negative beta weight for change in skin temperature is in the expected direction.